

CLAIMS

1. A handling unit (1) for palletizing, characterised by comprising:
  - a support (2) for coupling to manipulator means;
  - a framework (3) associated with said support (2) and defining an aperture;
  - a pair of parallel opposing slide rails (5) fixed to said framework (3);
  - at least one flexible sliding panel (7) slidable along said rails (5) between an extended position in which it completely closes said aperture to enable it to support articles to be palletized, and a retracted position in which it opens said aperture to enable said articles to fall through said aperture;
  - drive means (18, 19) for sliding said panel (7) along said rails (5).
2. A handling unit (1) as claimed in claim 1, wherein a first section of said rails (5) extends along two opposing circumferential portions and a second section thereof extends along two horizontal opposing portions, said rolling shutter (7) occupying only the first section extending along the two circumferential portions when in its retracted position.
3. A handling unit (1) as claimed in claim 2, wherein said rolling shutter (7) occupies only the second section extending along the two horizontal portions when in the extended position
- 20 4. A handling unit (1) as claimed in claim 2, wherein said framework (3) comprises a pair of vertical opposing side walls (4) defining said aperture.
5. A handling unit (1) as claimed in claim 4, wherein said horizontal portions of the second section of the rails (5) are fixed to the inner sides of the pair of side walls (4).
- 25 6. A handling unit (1) as claimed in claim 2, wherein said drive means comprise at least one movable motor (18) rotating a first movable drive

pinion (19) engaging a first fixed circumferential rack (20) with which one of the opposing circumferential portions of the first section of the rails (5) is associated.

7. A handling unit (1) as claimed in claim 6, wherein said first drive pinion (19) is axially keyed via a shaft (21) to a second movable pinion (22) engaging a second fixed circumferential rack (23) with which the remaining opposing circumferential portions of the first section of the rails (5) are associated.

8. A handling unit (1) as claimed in claim 7, wherein said first pinion (19) and said second pinion (22) are maintained constantly engaged with said first rack (20) and with said second rack (23) respectively, by a pair of rigid arms (24) rotatably associated with a pair of circular elements (6) coaxial with the circumferential portions of the first section of the rails (5).

9. A handling unit (1) as claimed in claim 8, wherein said first pinion (19) and said second pinion (22) are respectively associated with one end of said sliding panel (7) by a pair of opposing connecting rods (25).

10. A handling unit (1) as claimed in claim 1, wherein said sliding panel comprises a plurality of parallel cylindrical rods transverse to the sliding direction, connected together in pairs by offset chain links (9, 10).

20 11. A handling unit (1) as claimed in claim 10, wherein the ends of said rods (8) are rotatably associated with wheels (16) which roll within said rails (5).

25 12. A handling unit (1) as claimed in claim 1, comprising loading means for dragging articles to be palletized onto said panel (7) when in its extended position.

13. A handling unit (1) as claimed in claim 12, wherein said loading

means comprise a loading carriage (32) slidingly associated with the framework (3).

14. A handling unit (1) as claimed in claim 13, wherein said loading carriage (32) presents a quadrangular configuration with its opposing sides adjustable towards and away from each other.
15. A handling unit (1) as claimed in claim 1, further comprising means for taking and releasing slip sheets.
16. A handling unit (1) as claimed in claim 15, wherein said means for picking up and releasing slip sheets comprise a pantograph structure (40) carrying a plurality of suckers (45) for adhering to the surface of a slip sheet (200).
17. A handling unit (1) as claimed in claim 16, wherein said suckers (45) are associated with venturi valves (45) for creating vacuum within the cavities of the suckers (45).
18. A handling unit (1) as claimed in claim 16, wherein each sucker (45) is driven by a cylinder (55).
19. A handling unit (1) as claimed in claim 1, further comprising means for picking up and releasing surrounds.
20. A handling unit (1) as claimed in claim 19, wherein said means for picking up and releasing surrounds comprise two opposing pairs of rocker members (60) with which means (68) are associated for engaging the surround.
21. A handling unit (1) as claimed in claim 20, wherein said rocker members (60) are pivoted on a pair of plates (62) which can be moved upwards away from the aperture and downwards towards the aperture.
22. A handling unit (1) as claimed in claim 1, comprising a pair of

mutually facing sliding panels (7') slidable along a pair of mutually facing rails (5) between a position in which said panels (7') are positioned mutually abutting to completely close said aperture and a retracted position in which they are mutually withdrawn to open said aperture.

- 5 23. A handling unit (1) as claimed in claim 1, wherein said manipulator means comprise a robot.
24. A palletizer robot comprising a handling unit in accordance with claim 1.